Aging Phenomena in Poval-filaments

AUTHOR(S):

Hirabayashi, Kiyoshi; Sone, Yasuo

CITATION:

Hirabayashi, Kiyoshi ...[et al]. Aging Phenomena in Poval-filaments. 京都大学化学研究所報告 1950, 23: 78-78

ISSUE DATE:

1950-12-30

URL:

http://hdl.handle.net/2433/74172

were more evidently emphasised by observing photometer curves.

From the above mentioned results, we were obliged to recognize that the aging process in semi-molten poval-filaments was not a crystal growth as in ordinary low molecular substances, but a change of state to approach regular crystalline structure from non-crystalline structure.

71. Aging Phenomena in Poval-filaments.

Kiyoshi Hirabayashi and *Yasuo Sone.*

(Sakurada Laboratory)

Aging phenomena in semi-molten poval-filaments were persued by means of change of its ability of swelling and tolerance to hot water, etc. The swelling degree was represented in percentage of total weight by measuring the maximum water absorption at 30°C. and the ability of tolerance to hot water was measured by softening temperature of filaments hanged in water with constant load and constant temperature elevation. The experiments performed were as follows, (1) Time dependency upon swelling and softening temperature. (2) Effect of temperature, elongation and water contents upon aging. (3) Dilatometric measurement. It was found that there exists a linear relationship between swelling and softening temperature and the temperature facter was more pronounced than other effects. In addition to these facts, some volume contraction (57% P. V. A. 10 days. V. C. 0.256%) during aging were observed.

A relation between velocity of aging and heat-treatment were proposed as follows from theoretical point of view.

$V = AT^{\frac{1}{2}} e^{-E/RT}$, where V=velocity, T=abs. temperature,

E=activation energy.

From the experiments of swelling, it was deduced that the activation energy was 20–30 kcal/mol.

We are now discussing on the numeral deviation from the former report (A. E. 10–12 kcal/mol.), however, anyway it was proved that aging process should take place in the semi-molten poval-filaments.

72. Crystal Structure of Polyvinyl Alcohol.

Ichiro Sakurada, Keiroku Fuchino and *Noboru Okada.*

(Sakurada Laboratory)

It has been said[1] that the molecular repeat distance of polyvinyl alcohol 2.52 Å